Study on the effectiveness of Extreme Cold Mist MQL system on turning process of stainless steel AISI 316

A S Jamaludin[1],*, A Hosokawa[2], T Furumoto[2], T Koyano[2], Y Hashimoto[2]

[1] Faculty of Manufacturing Engineering, Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia
[2] Institute of Science and Technology, Kanazawa University, Kakuma-machi, Kanazawa, 920-1192, Ishikawa, Japan

shahir@ump.edu.my

Abstract. Cutting process of difficult-to-cut material such as stainless steel, generates immensely excessive heat, which is one of the major causes related to shortening tool life and lower quality of surface finish. It is proven that application of cutting fluid during the cutting process of difficult-to-cut material is able to improve the cutting performance, but excessive application of cutting fluid leads to another problem such as increasing processing cost and environmental hazardous pollution of workplace. In the study, Extreme Cold Mist system is designed and tested along with various Minimum Quantity Lubrication (MQL) systems on turning process of stainless steel AISI 316. In the study, it is obtained that, Extreme Cold Mist system is able to reduce cutting force up to 60N and improve the surface roughness of the machined surface significantly.